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ABSTRACT

Cognitively-based writing instruction for educationally disadvantaged students is examined, focusing on epistemic writing. The object of epistemic writing is to inquire into a particular topic and to familiarize/persuade the reader with the fruits of the investigation. In reviewing the distinctions between novice and expert writers, two models of competence in written composition are apparent: the knowledge-telling approach of novice writers, and the knowledge-transforming strategies of expert writers. To foster a shift from the novice to expert, research suggests that the higher order thinking skills that underlie epistemic writing must be fostered. A specific writing environment, Monitoring Instruction plus Strategic Execution (MUSE), was designed for 31 tenth-graders in Canadian classes for normally achieving and learning-disabled students. Specific portions of instructional time were spent in modeling expert-like thinking strategies. Posttest results suggest the potential of the strategy for bringing students closer to the expert position, the writing-to-learn process. Implications for instruction of at-risk students are discussed. Two figures and a 35-item list of references are included. The paper's discussant is Harvey A. Daniels in a training section entitled "Teaching Writing to At-Risk Students". (SLD)

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TEACHING WRITING TO STUDENTS AT RISK FOR ACADEMIC FAILURE

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TEACHING WRITING TO STUDENTS AT RISK FOR ACADEMIC FAILURE

In North America, writing is increasingly likely to be conceptualized as a learning tool that should constitute an integral part of the school curriculum at each stage in a student's development. Willinsky (1990) refers to this view of writing as "the New Literacy," and suggests that this pedagogical model represents a major shift from the way that educators have traditionally defined and implemented writing instruction. One might venture to say that in enlightened educational environments, students are encouraged to "write to learn" through a set of intellectual activities that integrate curricular strands, rather than to "learn to write" as an isolated practice engaged in for its own sake. Writing to learn is about composing texts in rich social contexts for personally defined goals—texts that actively involve students in coming to terms with saying something meaningful, irrespective of whether the particular task involves constructing a reflective argument, telling a story, composing a poem, or describing something interesting to a pen pal.

Needless to say, any specific discussion of "writing" means calling attention to a restricted range of activities and resultant products, both of which vary considerably across cultures and historical periods (De Castell & Luke, 1983). In this paper, we focus on a particular kind of writing that we refer to as "epistemic," the object of which is both to inquire into a particular topic and also to familiarize and/or to persuade one or more readers of the fruits of an investigation. Such tasks might include descriptive, opinion, or informative types of assignments. Evidence abounds that there is a huge gap between current pedagogical intentions with regard to epistemic writing and their execution in classroom instruction (Applebee, 1981). In a similar vein, large-scale evaluations of students' writing indicate that by secondary school, only a minority of normally achieving learners acquire a level of expertise in written composition that extends beyond functional literacy (Kirsch & Jungeblut, 1986).

For students deemed "at risk for academic failure" (e.g., learning disabled, minority, or poor children), the picture is even more bleak. Writing instruction for chronic low achievers typically focuses on techniques for remediating so-called "basic" skills such as spelling, grammar, and handwriting. A central assumption made by many educators of low-achieving students is that the acquisition of so-called "low-level" text production skills is a necessary prerequisite to the acquisition of composing skills associated with writing as a powerful tool for personal learning, such as problem-solving strategies and rhetorical knowledge. A direct consequence of this "bottom-up" approach to writing instruction is that the achievement gap increases as students move through school, and at-risk learners become progressively more disadvantaged because of a systematic lack of instruction in the higher-order skills that underlie epistemic writing. Accordingly, a more equitable and socially conscious use of the term *at risk* would be to characterize

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those learning environments that are at risk of failing to provide a substantial proportion of students with equitable access to an empowering and successful educational experience.

In this paper, we outline the cognitive concomitants of epistemic writing by reviewing literature on the composing processes of both novice and expert writers. We will focus our discussion on two models of competence in written composition—knowledge-telling and knowledge-transforming—which are differentiated according to level of expertise in the domain. We will proceed from this foundation with an integrative overview of the instructional implications of our analysis of the cognitive barriers to the acquisition of epistemic writing. We will elaborate on the general instructional implications by describing a specific intervention study from our research program. The main goal of the M.U.S.E. (Monitoring Understanding + Strategic Execution) writing program is to foster expert-like problem solving during composing through the provision of a learning environment that features explicit cognitively based instruction in, modeling of, and support for knowledge-transforming types of writing strategies. In concluding, we will reflect on the sociocultural implications that stem from shifting control of the learning process from teacher to student. We also discuss the significance of key features of our specific model of composition instruction for accomplishing a wider goal—namely, the development of an empowering pedagogy for at-risk learners.

Writing as Problem Solving: Insights from Novice–Expert Models of Composing

Common sense wisdom suggests that, for novices and experts alike, written composition is a difficult and complex task. Perhaps writing is so demanding because it is a complex task that is best addressed as a problem-solving endeavor (that is, with a well-regulated application of strategies, subskills, and appropriate knowledge) but is, in essence, a task in which no problem is given.[1] The theme, story line, or argument must be constructed by the writer through cycles of deliberate knowledge-building sessions. Research on thinking during composing, however, suggests that experts' writing problems are qualitatively distinct from those faced by novices.

Thinking-aloud protocols analyzed in research on the composing processes of expert writers (Flower & Hayes, 1980) reveal a tremendous investment of mental effort in the elaboration, coordination, and execution of complex goals and subgoals, such as how to shape content for a particular audience, how to express conceptual intentions in the language of prose, or how to construct a catchy title. In stark contrast, novice writers' thinking-aloud protocols reveal that, given a writing assignment, they set to work and proceed directly toward their goal in a forward-acting manner. False starts and

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[1] An earlier version of the description of these models appeared in Bryson, Bereiter, Scardamalia, and Joram (1991).

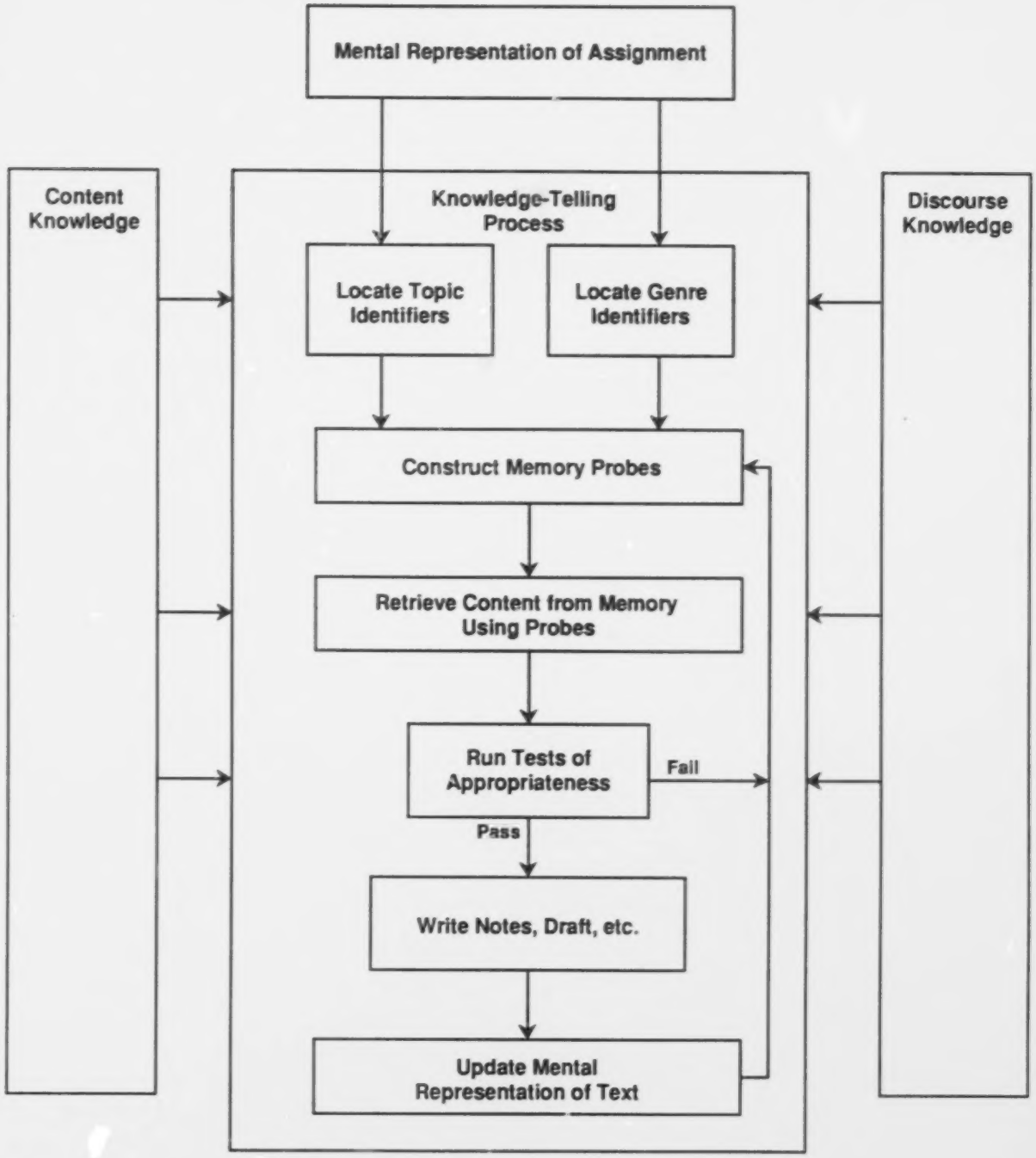
uncertainties as to how to proceed are rare. The most common difficulty faced by novice writers is knowing what to do when they run out of things to say about a given topic (Bereiter & Scardamalia, 1987).

To view writing as problem solving, therefore, is to view it in a somewhat paradoxical light. That is, not all writers view composition as a task that requires the kind of effortful and strategic use of cognitive resources that we commonly associate with problem-solving processes. The paradox can be largely removed by adopting the premise that expert and nonexpert writers are solving different problems. This premise is reasonable because of the ill-structured nature of writing problems. In particular, the goal in writing tasks is usually defined only in general terms, leaving the specification up to the writer. Consequently, writers who are ostensibly engaged in carrying out the same assignment can be pursuing radically different goals.

We have found it useful in our research on writing instruction to describe the thinking processes that characterize novices and experts using two contrasting models of composing (for more details, see Scardamalia & Bereiter, 1985). The "knowledge-telling" model avoids many of the problems of writing and, even for relatively young writers, makes efficient use of highly practiced skills. The "knowledge-transforming" model contains a dynamic that tends to escalate the complexity of writing problems. It is important to note that there are, undoubtedly, many models of composing in addition to the two that we have chosen to describe. Our goal here is to highlight clear differences in the underlying mental operations that appear to be accessible to immature, as compared with mature, writers. The fundamental purpose for including a section on the ways in which novice and expert writers seem to think during composing is to provide a theoretical foundation for our instructional recommendations.

Knowledge-Telling as a Problem-Reducing Strategy

Novice writers, whose thinking-aloud protocols show little or no evidence of planning or concern about main ideas or form, start writing almost instantly and proceed about as rapidly as they can move the pencil. According to the knowledge-telling model (Bereiter & Scardamalia, 1987), novice writers follow a procedure that enables them to reduce the problems of writing to a routine procedure for "telling what one knows about the topic" (Scardamalia & Bereiter, 1986, p. 792). According to this model (see Figure 1), knowledge tellers, once provided with a writing assignment (e.g., "Is television a good influence on children?"), begin automatically to retrieve knowledge using two kinds of cues. Topic identifiers (e.g., "television shows," "good aspects," and "children") serve as cues that prime associated concepts. Discourse knowledge provides a second type of cue. For instance, a writer whose concept of an opinion essay consisted of "Say what you believe about the question and give reasons" would use "Say what you believe" and "reasons" as retrieval cues, which, in combination with topic identifiers, would be used to retrieve from memory ideas relevant to defending an opinion about children and



Source: Bereiter & Scardamalia, 1987

FIGURE 1 STRUCTURE OF THE KNOWLEDGE-TELLING MODEL

television. Knowledge tellers typically transcribe information as it is called up from long-term memory, or in short-circuit "think-say" cycles, rather than transforming it to fit rhetorical and more broadly based content goals.

The following segment of a sixth-grade student's thinking-aloud protocol (from a study conducted by Paris, 1986) illustrates the forward-moving nature of knowledge-telling in response to general topic and discourse structure cues. (Content statements are italicized.)

Segment from a Novice Writer's Thinking-Aloud Protocol

I think it is good and bad for children to watch television because I like the cartoons and some sad movies.

But I like good movies that come on T.V. because they are good to watch.

But usually it is good to watch comedy shows because they are very funny.

They keep you laughing almost every time you watch them.

It is good to watch interesting movies.

Interesting shows like Young and the Restless, All My Children, and General Hospital. . .*because it's sometimes exciting.*

But pay T.V. has some very good movies like Splash, Police Academy, Romancing the Stone.

But sometimes I watch sports.

My favorite sport is baseball.

I like football, but not that much.

I hate golf and tennis and all the other stuff except soccer.

But I usually watch wrestling at my friend's house because it's kind of exciting and I like the way they fight.

The overall picture of the composing process exhibited by this sixth-grade writer during thinking aloud is characteristic of the kinds of content-based thinking typically manifested by novice writers as predicted by the knowledge-telling model. The predom-

inant activity is generating topic- and genre-appropriate content. The knowledge teller does not represent the task of composing as a goal-directed one in which epistemological and rhetorical problems must be jointly resolved. Rather, the novice writer's greatest difficulty seems to be that of accessing a sufficient quantity of relevant knowledge to satisfy length and genre requirements. Problem-solving episodes are infrequent in knowledge tellers' thinking-aloud protocols because the task routine manages to bypass content-related as well as rhetorical problems.

Writing to Learn, or Expert Composing as Knowledge-Transforming

There are numerous testimonials from writers indicating that writing itself plays an important role in the development of their understanding (Murray, 1978). Henry Miller suggested that "Writing, like life itself, is a voyage of discovery." In a recent interview, Sam Shepard said:

> *The great thing about writing is that in the course of going after it, it teaches you something. You start out thinking you know something about it, but then you discover you hardly know anything. And the more you do it, the more things begin to inform you about where you're going.* (Sessums, 1988, p. 78)

Likewise, Robert Frost reported that "I have never started a poem whose end I knew. Writing a poem is discovering."

Scardamalia and Bereiter (1985) have described the expert writer's composing processes as a dialectical interplay between content problems (what to say?) and rhetorical problems (how to say it?). These authors argue that expert writing involves successfully managing the coordination of both kinds of problems. Content problems are problems of the writer's own knowledge and beliefs, and rhetorical problems are problems related to achieving the writer's purposes. The following segment from an expert writer's thinking-aloud protocol (adapted from Paris, 1986) illustrates how a writer wrestles with both kinds of problems, and how the two kinds of problems interact. (Content statements are italicized.)

Segment from an Expert Writer's Thinking-Aloud Protocol

So, I'm looking for examples of programs that could be argued. . .that could be argued were good influences on children.

Now I know I already don't believe this, but *Sesame Street* comes to mind as a possible good influence.

And I find myself trying to work it out.

So I'm going to say. . . .

I'm making up two columns here. . .and just trying to respond to my own thought processes.

Sesame Street *jumped to mind as a good influence.*

So I guess what I need is three columns here. . . . I need a column just for the specific and the example. And I can work back and forth between columns.

Sesame Street *is good because it could be argued that it educates.*

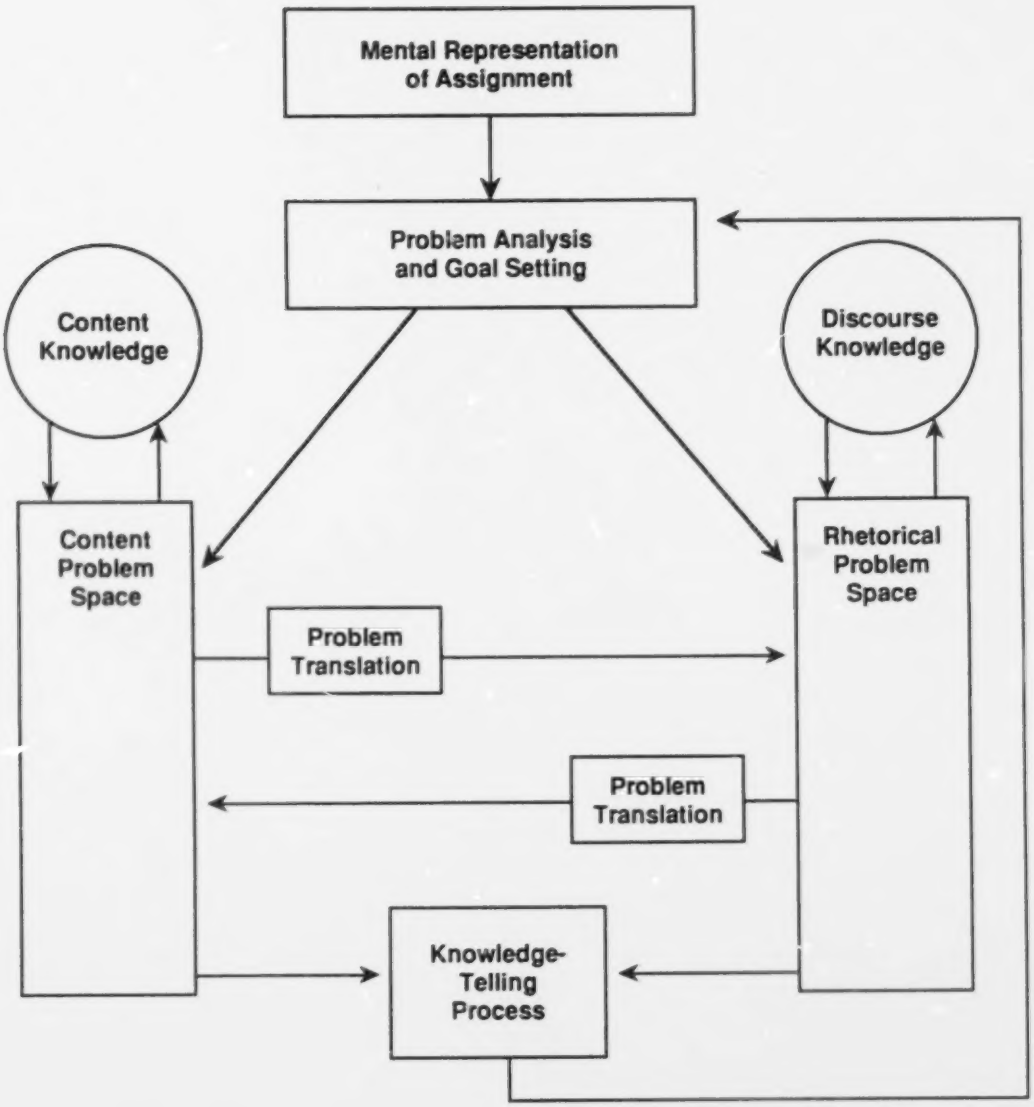
And it educates in a specific way. . .giving children basic information, A.B.C.s, et cetera.

But immediately when I say it's a good influence, I have reservations about it.

Now I'm just trying to clarify for myself the reservations about it. . . .

In the knowledge-transforming model of expert writing (see Figure 2), problems arising in the "rhetorical space" are often translated into problems requiring solution in the "content space." New decisions arrived at in the content space also create new problems in the rhetorical space, and so on in a dialectical fashion. The result often will be that by the end of the composing process, both the writer's ideas and the nature of the written product have evolved in unexpected ways. Hence the experience of writing as discovery.

Solving content and rhetorical problems interactively is the distinctive characteristic of the knowledge-transforming model of writing. Thinking-aloud protocols generated by expert writers suggest that significant composing problems emerge from this back-and-forth interplay between knowledge and goals. As we described at the beginning of this section, expert writers often suggest that they experience a profound sense of



Source: Bereiter & Scardamalia, 1987

FIGURE 2 STRUCTURE OF THE KNOWLEDGE-TRANSFORMING MODEL

"discovery" or "new learning" as a direct consequence of their composing activities. We have argued elsewhere (Bryson, Bereiter, Scardamalia, & Joram, 1991) that the dialectical processes that underlie a knowledge-transforming approach to composing are probably responsible for the learning that can occur as a by-product of writing. In contrast to "writing as dialectic," a more linear approach to writing (such as is often recommended in composition textbooks) would settle all the content issues first, after which the composition would be planned and carried out in a straightforward manner. But, as we have noted, expert composing processes are characterized by recursion, so that planning keeps being reactivated throughout.

Before describing the instructional implications presented by our conceptualization of writing in terms of fostering a transition from knowledge-telling to knowledge-transforming, however, we need to comment on the particular writing difficulties faced by students at risk for academic failure.

Process Analyses of At-Risk Student Writers

To date, studies of so-called "novice" writers have typically used normally achieving school- or college-age students to construct models of immature composing strategies (e.g., Scardamalia & Bereiter, 1986; Flower & Hayes, 1980). This practice raises a question concerning the suitability of such models for understanding the particularly intransigent problems exhibited by students at risk for academic failure.

Traditionally, educators have used a deficit model to conceptualize the writing problems presented by so-called "educationally disadvantaged," "underprepared," or "basic" student writers. This approach focuses on the inability of at-risk students to cope with the demands of literacy tasks as they are constituted within conventional, mainstream educational environments. Remediation usually consists of breaking down complex writing tasks, like composing a persuasive letter, into two levels of ability that are structured linearly from lower-level, or "basic" skills like spelling and punctuation to higher-level, or more demanding intellectual processes like synthesis or critical analysis. The main assumption here is that students need to acquire facility with basic skills before they can tackle the intellectually more demanding aspects of complex tasks. Writing instruction for at-risk students that is designed using a two-level approach to curriculum sequencing effectively prevents at-risk students from receiving instruction in higher-order thinking skills because they spend almost all their time attempting to master the basics. As Griffin and Cole (1984) suggest:

> *The widespread use of this educational strategy has, where proper management techniques are used, brought children up to grade level on "the basics" but failed to boost them into the higher-order activity. Widely discussed as the 3rd-4th grade watershed, the heavy focus on level 1 skills seems to help children do only what they were trained to do in a rote way; there is no "transfer" of the achievement up into the "higher level" of learning. A number of minority children get stuck at level 1: They are not exposed to practice with activities at higher levels of the curriculum when*

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they do not demonstrate mastery of the "basics." This failing is then attributed to the children's own lack of ability for the "higher" skills, which they were neither tested on nor taught. (p. 207)

There is no good reason for assuming that at-risk students are uniquely disadvantaged in the domain of higher-order thinking, or that remediation in basic skills will help them to become better writers. A more plausible assumption is that educationally prepared students come to school having learned more than unprepared students about the kinds of literate uses of language that schools validate. One source of evidence for this approach to understanding the writing problems that are particular to at-risk students is analyses of their texts for clues about underlying difficulties. As Hull and Rose (1989) suggest, a very good example of this kind of textual analysis is Mina Shaughnessy's *Errors and Expectations* (1977), a fine-grained description of hundreds of essays written by underprepared students during the open-admissions era of New York's City College. Shaughnessy categorized and interpreted students' errors by trying to imagine their sources. Her main finding is that students' errors reflect an incompatibility between their spoken language and the arbitrary conventions of standard written English.

A necessary adjunct to studies of what students write is to design and implement research methodologies that promise to make explicit how students compose texts. Cognitively based analyses of students thinking aloud during composing have proven particularly useful in advancing our understanding of the mental operations that underlie the composition of error-filled texts by underprepared student writers. Perl (1979), for example, had five marginal students generate thinking-aloud protocols while they composed two essays. Her main finding was that although these students displayed many of the writing processes that characterize adaptive student writing—prewriting, writing, and editing—their coordination of these activities was dysfunctional. For example, students frequently interrupted their idea generation during composing to correct misspellings or punctuation problems, which resulted in failed attempts to sustain a coherent train of thought.

Bryson (1989) found that analyses of reading-disabled adolescents' thinking aloud during composing revealed similarities between their writing strategies and those outlined in the knowledge-telling model of novice composing. Notably absent from the thinking-aloud protocols—as well as from outwardly manifested behaviors such as notetaking or revision—both of reading-disabled and normally achieving novice writers was any semblance of higher-order thinking skills. Bryson suggested that ineffective learners appear to persist, often indefinitely, in a novice performance mode. As a result, faulty, ineffective effort-minimizing strategies become entrenched and inaccessible. These students figure out a sure-fire way to satisfy the basic requirements of a writing assignment without making themselves vulnerable by taking risks or setting goals that would require significant personal investment in the task. An additional dysfunctional behavior exhibited by ineffective learners is a tendency to respond to in-task difficulties by blaming themselves, rather than trying to solve the problems. Maladaptive strategies

for coping with on-task difficulties also characterize the thinking-aloud protocols of highly apprehensive writers (Selfe, 1985) and of those afflicted with severe writer's block (Rose, 1980). Daly (1978) reports that low-ability writers tend to display high levels of writing apprehension. Thus, it is reasonable to expect that many underprepared writers would be highly apprehensive about writing and exhibit dysfunctional strategies during composing.

Accordingly, we might wish to think of at-risk students as novice writers who are uniquely unfamiliar with the conventions of standard written English and who develop, with a cumulative record of in-school failure, dysfunctional coping strategies that interfere with the acquisition of more sophisticated composing processes.

Instructional Implications: Fostering a Shift from Knowledge-Telling to Knowledge-Transforming

We have described two different composing models: writing as a form of knowledge telling and as a process of knowledge transformation. We used the categories of "novice" and "expert" to differentiate between immature and mature writers. However, this kind of analysis raises the question of how a student might best be facilitated in making a shift toward a more advanced kind of composing. We don't want to be satisfied with having "labeled" a student, but would like to make use of these models to promote more "expert-like" thinking in novice writers.

Many people grow up seldom or never doing epistemic writing, however, and so it is not surprising that many students never develop a knowledge-transforming approach. The blame is often placed on schools for treating writing as an exercise and never engaging students with its epistemic aspects (Applebee, 1981; Emig, 1971; Graves, 1983). That may be a justifiable charge, but it cannot be the full explanation. Expert writers have emerged from unpromising school backgrounds. And school educators have reported to us that even with a very enlightened writing program, in which writing activities are designed to engage students' interests and concerns as fully as possible, many children who start out as serious and thoughtful writers begin, by the middle years of school, to lapse into mindless routines and to avoid writing that really challenges their abilities. It seems reasonable, therefore, to suppose that there are also cognitive barriers to developing the knowledge-transforming process.

In the research to date on composition instruction, there are two arguments about how to promote higher-order thinking in student writers. Some have suggested that problem solvers have a finite set of mental resources to devote to a task, and that all writers have higher-level strategies available but that they are suppressed as a result of attending to lower-level concerns. One such intervention for teaching writing is "free writing" (Elbow, 1973), in which writers are instructed to ignore low-level problems like

spelling during first-draft composing in order to free their mental capacity for higher-level concerns such as planning.

Likewise, word processors are often thought of as tools that liberate writers from mechanical concerns, yet evidence from implementation studies suggests that caution is in order in recommending computers for fostering higher-order thinking in immature writers. Instructional research studies to date (see, for example, Joram, Woodruff, Bryson, & Lindsay, 1991) provide no evidence that novice writers have at hand a repertoire of high-level problem-solving strategies that are ready to emerge when low-level attentional demands are reduced. Instructions to immature writers to ignore low-level concerns do not free them to focus on high-level problem solving because they are not engaged in solving high-level problems.

A second line of argument concerning instruction for novice writers focuses on the need to provide instruction in, and supports for, the acquisition of advanced, or expert-like, composing strategies. A key assumption that underlies this approach is that novice writers are limited by the kinds of thinking they engage in during composing, in addition to experiencing a kind of cognitive overload that results from a lack of automaticity, or fluency, in basic skills.

It would appear that access to knowledge and verbal fluency, although incorporating several necessary conditions for good writing, are not sufficient for the development of an expert-like mode of writing. The most difficult aspect of writing for the novice is not to gain access to knowledge but to know what to do with knowledge so as to transform a list of disconnected facts into a powerful idea, an evocative story, or an elaborate conceptual structure. Thus, instruction for novice writers should focus on fostering the kinds of higher-order thinking skills that underlie epistemic, or knowledge-transforming writing.

Cognitively Based Instructional Environments That Foster Expert-Like Problem Solving

Results from instructional studies conducted by members of the Ontario Institute for Studies in Education (OISE) Writing Research Group (for an overview, see Bereiter & Scardamalia, 1987) suggest that several factors are involved in enhancing expert-like composing, as follows. We describe each component separately and discuss how it was incorporated into the design and evaluation of a specific writing environment called M.U.S.E. M.U.S.E. was designed to teach 10th-grade normally achieving and reading-disabled students strategies for sustaining independent reflective inquiry during the composition of argument-type texts (Bryson, 1989).

In the assessment study of the M.U.S.E. environment, our subjects were 31 students in two 10th-grade classes—one for normally achieving students and one for severely reading-disabled students. The intervention for students in the experimental group

included strategy-based instruction, modeling of expert-like thinking, and procedural facilitation. The intervention for students in the control group involved instruction in the structural features of good arguments (beliefs and reasons on both sides, facts/descriptions/examples, and conclusions). There were 10 instructional sessions for students in both groups over a 5-week period. Sessions were 70 minutes long. Post-test texts written by both normally achieving and reading-disabled experimental students were rated as significantly more reflective and structurally more complex than those written at pretest. Likewise, posttest analyses of control students' texts and thinking-aloud protocols revealed no gains as a result of instruction in the structural features of good arguments.

Below we describe the major theoretical principles driving the design of M.U.S.E. and the way in which each principle has been applied.

Explicit Strategy-Focused Instruction

Analyses of experts' thinking during composing reveal that they are using specific higher-order strategies to permit an active and effortful approach to writing. These strategies can be made explicit and taught directly to novice writers to foster a more expert-like approach to composing. Novice writers seem to lack these "heuristics for writing"—that is, executive strategies for making use of what is already known to extend current knowledge. For example, Scardamalia, Bereiter, and Steinbach (1984) taught reflective writing strategies to sixth-grade students and included instruction in a simplified version of dialectical reasoning. This was explained to students as "a matter of trying to 'rise above' opposing arguments by preserving what is valid on both sides" (p. 181). Posttest results revealed that the experimental students' compositions were rated as significantly more reflective than those generated by control-group students. In an intervention study aimed at fostering expert-like revision strategies, Scardamalia and Bereiter (1983) taught students to stop after composing individual sentences in order to execute a routine of evaluating generated text, diagnosing problems, choosing a tactic, and carrying out any revision decided on. Results revealed that students' revisions improved significantly from pre- to posttest in terms of both the kinds of thinking exhibited during composing and the rated quality of texts.

Teaching expert-like strategies to novice writers probably is not sufficient to bridge the gap between knowledge-telling and knowledge-transforming composing behaviors. Purposive skilled writing seems most likely to be learned in dynamic social contexts that provide elaborate support for, and modeling of, expert-like composing. Nonetheless, some kind of instruction in expert-like thinking processes during composing is probably a necessary component of an instructional program.

M.U.S.E. Application—Students received instruction in a set of reflective operations, as well as in strategies for argument construction. The strategies were divided into two main categories:

- Problem-solving strategies: (a) plan, (b) identify confusions, and (c) notice opportunities for new learning.
- Verbal-reasoning strategies: (a) build an argument, (b) challenge its assumptions, (c) elaborate statements, (d) search for additional ideas, and (e) put it together.

Procedural Facilitation

To foster more complex kinds of thinking in novice writers, it has proven to be critical to provide students with support for carrying out more demanding kinds of thinking. Scardamalia and Bereiter (1986) suggest that:

> *In procedural facilitation, help is of a nonspecific sort, related to the students' cognitive processes, but not responsive to the actual substance of what the student is thinking or writing. Help consists of supports intended to enable students to carry out more complex composing processes by themselves. . . . It can do little good to direct students' attention to their goals for composition if they are not consciously able to represent such goals. There is substantial evidence that procedural facilitation can increase the level of sophistication of the composing processes students carry out within the limits imposed by the kinds of mental representations they construct.* (p. 796)

M.U.S.E. Application—To take over some of the information-processing load imposed by presenting students with a wholly new set of thinking strategies during argument construction, we provided "thinking prompts" for each of the target strategies. Prompts took the form of sentence openers printed on cards. For example, a student who had decided to get some help to challenge an argument in favor of a particular resolution could get a "challenge" prompt, such as: "Yes, I can understand the argument, but what about. . ." or "A person who would be affected negatively by my argument could say that. . . ." Students were encouraged to incorporate the sentence openers into their thinking during argument construction.

Modeling Thought

Expert-like thinking during writing is usually invisible to students, who typically are able only to view finished products that reveal none of the cognitive activities behind their composition. Modeling expert-like thinking during composing has proven to be a powerful instructional technique for helping novices to acquire more effective kinds of writing strategies.

M.U.S.E. Application—Significant portions of the instructional sessions in the evaluation study of the M.U.S.E. environment were devoted to the modeling of expert-like composing strategies, first by the instructor and then by students. This provided

novice writers with the opportunity to witness, and then to practice, a higher level of argument construction than we had observed at pretesting.

The M.U.S.E. study provides us with an example of the kind of learning environment that can encourage novice writers to engage in a kind of thinking during composing that is closer to our expert model—a model of writing-to-learn processes. In this study, a cognitively-based analysis of students' thinking during composing suggested that both normally achieving and reading disabled students tended to conceptualize writing tasks in terms of telling what they knew about a particular topic, rather than thinking of writing as an opportunity to reflectively challenge their preconceptions.

The posttest results suggest that it is possible to foster reflective problem solving during composing by providing immature writers with a combination of strategies instruction and a supportive, socially collaborative environment. Novice writers need to learn how to think as "real" writers do—that is, in relation to a given writing task, to conceptualize and deal with interesting problems whose resolution during composing affords possibilities for discovery.

Implications for Writing Instruction with At-Risk Students

Studies of literacy instruction offered in Chapter 1 programs reveal that typically students at risk for academic failure receive: (a) Less classroom reading instruction than nonparticipants and (b) teaching that concentrates on basic, or low-level, skills rather than on higher-order thinking strategies (Allington & Franzen, 1989). This kind of inequitable pedagogy increases the achievement gap over time between the haves and the have-nots in a purportedly democratic educational system.

The results from our M.U.S.E. study offer potentially valuable insights into the kind of instruction that can effectively foster expert-like thinking in students who are least likely to demonstrate strategic control over composition processes. Clearly, the particular problems faced by students deemed at risk for academic failure are not necessarily comparable to those faced by students labeled as having a learning disability. However, Ysseldyke, Algozzine, Shinn, and McGue (1982) found negligible psychometric differences between groups of students identified as learning disabled and low achievers. In fact, all such labels probably have much more to do with institutionally constructed procedures for categorizing and streaming students who appear to have serious difficulties with school work than with genuinely distinct categories of individuals. Thus, it is plausible to infer that instruction which was successful in improving learning-disabled students' written products and in enhancing their composing processes might also be valuable for students at risk for academic failure.

Students who are underprepared for dealing with the kinds of literacy tasks that are the mainstay of traditional schooling require intervention on several different levels, as discussed below.

Learning Literate Uses of Language

Sociolinguistic studies provide a growing body of evidence that at-risk students lack experience with the uses of language that characterize academic literacy (Heath, 1983). French sociologist Pierre Bourdieu has argued that unless the exclusionary aspects of language are explicitly attended to in educational contexts, literacy instruction serves to entrench or "reproduce" existing social inequities (Bourdieu & Passeron, 1977). Epistemic writing, as we have described it in this paper, demands a certain relationship to language that can exclude students who have either a low socioeconomic or a minority cultural background. As Hull and Rose (1989) have argued, underprepared students need to learn a wholly new, unfamiliar, and intimidating kind of language to express themselves as writers in academic composition tasks. These authors suggest that at-risk students benefit from opportunities to imitate, and to practice using, kinds of discourse with which they are unfamiliar. Accordingly, it seems likely that basic writers would benefit from instruction in the kinds of literate uses of language, or genres, that characterize academic writing.

Making Visible the Invisible: Providing a Window on Expert-Like Thinking

The foundation of epistemic writing is the subordination of text-making activities to learning goals. Expert-like writing involves deliberate, reflective, strategic kinds of thinking directed toward extending the cutting edge of one's own competence by representing and solving problems that require the generation of new knowledge. This complex web of higher-order thinking processes is "in the head," and hence largely invisible to the immature writer who sees only a polished finished product. As Collins, Brown, and Newman (1990) suggest:

> *Standard pedagogical practices render key aspects of expertise invisible to students. In particular, too little attention is paid to the processes that experts engage in to use or acquire knowledge in carrying out complex or realistic tasks. . . . Few resources are devoted to higher-order problem solving activities that require students to actively integrate and appropriately apply subskills and conceptual knowledge.* (p. 2)

Evidence from cognitively based instructional studies in diverse domains suggests that low-achieving students benefit from opportunities both to model and to practice and appropriate expert-like thinking skills. A key factor in studies that have provided encouraging results in teaching higher-order thinking to low-achieving students has been the provision of some kind of support, or "scaffolding," during the learning of a new approach to a familiar task. The traditional model of learning, which focuses on the activities of a decontextualized learner who develops toward states of increasing

autonomy, essentially independently of any social network, has largely been supplanted by a model that features learning as a distinctively social process wherein responsibilities are negotiated, or "distributed," between two or more individuals. The provision of cognitive scaffolds for immature learners ensures that students at different levels of expertise have access to the kinds of support required for functioning at an optimal level.

Fostering Active Engagement in Learning Through Writing

Dewey (1916), Whitehead (1929), and more recent authors (e.g., Bereiter & Scardamalia, 1990; Collins, Brown, & Newman, 1990) have condemned the way in which conventional educational environments manufacture meaning for pupils by presenting learners with ready-made knowledge in isolation from any kind of meaningful context, and by artificially motivating students using some variation of the "carrot and stick" method. Clearly, writing activities that are not engaged in for any particular communicative or epistemological purpose are unlikely to result in active engagement of higher-order thinking processes. As Vygotsky (1978) suggested:

> *Teaching should be organized in such a way that reading and writing are necessary for something. If they are used only to write official greetings to the staff or whatever the teacher thinks up, then the exercise will be purely mechanical and may soon bore the child; his activity will not be manifest in his writing and his budding personality will not grow.* (p. 117)

Voices, Visibility, and Empowerment for At-Risk Students

Students who are labeled "at risk for academic failure" undoubtedly constitute a diverse group, including students whose cultural heritage is not consistent with the sociocultural context of mainstream schooling, as well as students who are unable to achieve acceptable levels of literacy for a variety of causes, none of which allow one to advance a deficiency model of underachievement. It seems important, therefore, to suggest that we undoubtedly need to expand our notions about what counts as "literacy." We need to question and to deconstruct the kinds of arbitrary constraints that historically have tended to exclude minority students from effectively participating in school-based literacy activities. Griffin and Cole (1984) conducted an intervention study with minority students in which learners wrote to pen pals and composed rap texts in collaborative sessions using microcomputers. The overlap between the genres used in this study and the students' linguistic background resulted in high levels of engagement and considerable effortful, strategic thinking during composing.

Conclusion

Clearly, we need to devote serious attention to the question of how to help children who come to school poorly prepared for the kinds of literacy activities that predominate in traditional educational environments. To date, the focus of Chapter 1 illiteracy

instruction has been on the provision of direct instruction in basic reading skills, to the virtual exclusion of teaching higher-order comprehension/interpretation skills as well as expert-like composing skills. It seems that the pedagogical emphasis in instruction for at-risk students needs to shift from a model of students as receivers of meaning to one that supports and values students as constructors of meaning. To this end, our main recommendations concerning the design of cognitively based writing instruction might be summarized as follows:

- Provide students with opportunities for imitating, practicing, appropriating, and modifying a wide variety of discourse forms.
- Make overt the covert cognitive activities that underlie expert-like composing by encouraging teacher- and student-directed modeling of thinking aloud and discussion of specific problem-solving strategies.
- Maintain attention to cognitive goals that involve learning and the transformation of knowledge through the writing process, in addition to text-based goals that pertain to satisfying specific task requirements.
- Provide support for distributed learning in a dynamic social context by including collaborative writing sessions and by structuring the learning environment so that everyone is both a teacher/learner and a reader/writer.
- Provide support, or cognitive scaffolding, for the acquisition of more powerful forms of thinking during composing, by structuring learning experiences that allow novice writers to practice new skills without being overwhelmed.
- Facilitate student-based ownership of an emergent learning agenda by encouraging students to set personally meaningful goals for writing and by ensuring that a genuine audience is available for children's texts.
- Identify the particular sociocultural biases that constrain traditional school-based definitions of literacy, and expand notions of what counts as "writing" so that minority students' linguistic heritage is not excluded.

Clearly, it seems fruitless to attempt to induce expert-like thinking in novice writers by providing instruction that focuses uniquely on the surface features of expert products, such as grammar or structural knowledge. It seems, rather, that students need explicit instruction in, and support for practicing and appropriating, the kinds of powerful thinking strategies that underlie expert composing. Likewise, immature writers need to be provided with writing environments where composing is a meaningful communicative activity that is engaged in for a wide range of personally constructed purposes. Perhaps it makes sense to conclude that, rather than trying to learn about writing, novices in this most exacting craft need to learn to think like writers, for whom it seems that composing is, and will always remain, a difficult and demanding intellectual pursuit.

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DISCUSSION: TEACHING WRITING TO AT-RISK STUDENTS

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As a former Chicago public school teacher and now as co-director of the Illinois Writing Project, I have been concerned with the teaching of writing to minority, disadvantaged, at-risk, inner-city students for over 20 years. Right now, I am working with a team of talented teacher-consultants in conducting an ambitious multiyear, citywide staff development project on writing instruction, an inservice program that is unfolding alongside the wider—and widely hailed—school reform efforts here in Chicago. In running this project, my colleagues and I are working in schools of at-risk children every day, trying to help them and their teachers with the challenge of writing. Because I am so thoroughly immersed in the perplexing adventure of helping teachers teach writing, Bryson and Scardamalia's paper is stimulating and welcome.

Bryson and Scardamalia provide strong empirical support for a major shift in the instructional strategies typically used to teach writing to at-risk students. Their research further discredits the skills-oriented curriculum that still prevails in so many public schools, especially those serving poor and minority students. Instead, Bryson and Scardamalia's work affirms the emerging "process" paradigm of writing instruction, which calls for "scaffolded" classrooms where students acquire higher literacy, not through decontextualized skill-and-drill, but through long-term modeling, instruction, and collaboration. And although Bryson and Scardamalia's research agenda is cognitive and their methodology is experimental, their findings are largely harmonious with those of other researchers who have focused more on social interaction, using qualitative research methods (Graves 1983; Heath 1983). Indeed, one very happy contribution of this paper is to solidify the emerging professional consensus about what sort of composition instruction is likely to work for students at risk—and, indeed, for students in general (Farr & Daniels, 1986). Among the key classroom strategies that this paper underscores, endorses, or recommends are:

- Students should spend less time on subskill activities and much more time composing whole original pieces of writing. This means providing ample daily writing time, which can be scheduled by reallocating the time currently spent on separate lessons in grammar, usage, spelling, handwriting, vocabulary, and the like.
- Students should select and develop their own topics for writing, rather than merely writing to whole-class, teacher-made prompts.
- Teachers should write along with their students, talking about their own planning, decision-making, and problem-solving strategies, thereby providing transparent demonstrations of how writers work.
- Teachers should schedule regular one-to-one writing conferences with students, since this structure provides the kind of scaffolded interaction that is most powerful in teaching writing.

- When teachers give students feedback on their writing, they need to focus more on coaching the writing process and helping the writer think through rhetorical problems, rather than on identifying errors. It is actually more helpful to be a sounding-board for writers than to give them advice.
- Classrooms should be full of social interaction around writing, with children coauthoring pieces, doing research in teams, sharing drafts aloud with the whole group, and helping each other revise in small peer editing groups.
- Above all, teachers of at-risk students need to believe that their children can write—believing in the power of their kids' language and the validity of their experience. At-risk children can and will write if provided the kind of rich, supportive, interactive, scaffolded classroom that Bryson and Scardamalia describe.

In our current inservice project in Chicago, these are precisely the strategies, activities, and attitudes that we are trying to help teachers embrace as they return to their students in regular inner-city classrooms, in Chapter 1, and in other special programs. And when teachers do implement this new kind of instruction, we often see dramatic results as these at-risk, over-drilled kids are freed to write and their teachers shift from correcting to coaching. These classrooms experience a writing boom. Children show a burst of fluency, productivity, and pride. Walls become covered with lavishly illustrated stories, poems, reports, posters, and cartoons. Letters fly out of classrooms, through the building, into the community, and around the country. Students keep journals filled with responses to books they are reading, as well as accounts of personal experiences, and they exchange these with other readers and writers. Home-made books are "published," catalogued, and shelved in the school library alongside the other authors of children's literature. Kids report that writing time is their favorite part of the school day; teachers testify that if an assembly or other schedule change impinges on writing time, the students rebel. Teachers also report, with delighted surprise, that these kids can really write after all, and sometimes they shake their heads with regret over past years of teaching when they did not even invite kids to write. Primary teachers often report that students learn phonics so effectively through inventing their own spellings that much less reading time is required for direct instruction in the sound-symbol relationships.

The overall message of Bryson and Scardamalia's paper, as validated through our experiences with teachers and children in Chicago, is this: at-risk kids need time to write, they need encouragement and coaching, and they need to believe in themselves as authors. Other, more privileged children have plenty of other family and community experiences that invite them to "join the literacy club." But for these at-risk children, we must be absolutely sure that school invites them into the circle of writers. This can be accomplished with amazing speed and effectiveness, if teachers change their instructional roles and practices in the key ways Bryson and Scardamalia have outlined in their paper.

Reactions, Concerns, and Suggestions

Bryson and Scardamalia are unusually realistic about the politics of literacy, schools, and change. They begin at the beginning by facing the worst-kept secret of American schools: that

students considered "at-risk" are almost invariably offered the most mechanistic, lowest-level curriculum, and that this pattern locks poor and minority students in at the lowest levels of achievement throughout school. Bryson and Scardamalia quite rightly turn the "at-risk" catch-phrase around from a blame-the-victim euphemism to a critique of schools: it is *schools* that are at risk, at risk of failing students by depriving them of experiences that might actually work.

Later in the paper, Bryson and Scardamalia raise the complementary political point that prevailing American definitions of literacy are narrow and highly discriminatory. "Mainstream" people label as "illiterate" communities of their fellow citizens who in fact use language, literacy, and print in very complex but divergent ways. The families and communities of "at-risk" students are filled with powerful and elegant uses of language and literacy, just as are all human communities. The fact that these communities are socioeconomically isolated from the mainstream culture naturally perpetuates these differences, and public schooling, at its most insidious and ironic, penalizes such variety.

The theoretical centerpiece of the paper is Scardamalia's familiar construct of two polar-opposite kinds of writing—knowledge-transforming or epistemic versus knowledge-telling. The epistemic category presents a highly idealized view of what expert writers do: subordinating task assignments to "overarching goals for learning and the transformation of current knowledge." A skeptic might ask Bryson and Scardamalia: "Well, how many term papers or business reports actually do offer (or can ever offer) such grand personal-growth possibilities?" On the other hand, there are plenty of real-life writing tasks that clearly fall into the disvalued "knowledge-telling" category and yet pose tremendously interesting cognitive problems. In reality, most writing tasks offer various degrees of knowledge-telling and transforming, and a continuum model would certainly be more palatable to most everyday writing teachers.

What Bryson and Scardamalia *do* contrast very effectively here is whether writing is planned or not. Expert writers have access to rhetorical planning strategies and have ways of balancing content and rhetorical concerns as the composing goes on; inexpert writers typically do not. To a great degree, the article is about metacognition: the two think-aloud samples included show one youngster whose planning consists only of possible sentences for the text, and one "expert" writer who talks almost exclusively about his own thought processes. The main contrast lies in composition-planning strategies: expert writers have them and can use them when possible, whereas inexperienced writers lack them and lack the metacognitive awareness to use them.

Bryson and Scardamalia show strong faith that such planning strategies can be mastered through "direct instruction," faith evidenced both in their repeated use of the phrase itself and in such research strategies as handing experimental students revision-prompting cards ("Yes, I can understand the argument, but what about...?"). These aspects of the M.U.S.E. program appear to show a lingering faith that higher-order cognitive operations can simply be planted in children by clear-cut, immediate, and simple interventions. And while the reported research results suggest that M.U.S.E. students did retain enough of the target planning behaviors to pass posttests with significant improvements, no improvements against the control groups or over any longer term were reported.

Bryson and Scardamalia's faith in direct instruction is matched by a lack of attention to collateral, unconscious, or incidental learning in the development of writing ability. Since this sort of learning is the primary mechanism by which human beings acquire their native *oral* language—and because writing is another language function—one should expect that these indirect learning processes would play an important if not predominant role in learning to write. Along these lines, for just one example, there is no discussion in the paper of students' *reading* experience as a source of implicit information about higher-order composition. Similarly, Bryson and Scardamalia seem to think that the only writers who possess planning strategies are those who can verbalize them for think-aloud researchers. This is an alluring but unsupported assumption. Most bicycle riders cannot verbalize their riding either, but most of them get around the block and some are champions. Many effective writers plan writing *by* writing; they find their direction and plan their text structure in the act of trying out directions, sentence by sentence. Undoubtedly, these writers are engaged in a reciprocal internal dialogue between content and form concerns, making long-range text-level plans, but they are doing it outside of awareness. Indeed, such a writer might be almost helpless to explain to herself or anyone else how the writing got planned and done. And yet we need not classify such a writer as lower on a developmental totem pole of expertness. Still, to be fair, Bryson and Scardamalia do not rely only on "direct instruction" in writing behaviors. They also respect and draw on theorists who argue for diffuse explanations of language learning. Further, their M.U.S.E. program included many elements that, if implemented consistently, would indeed facilitate plenty of such incidental learning.

Still, in these hectic days of school reform, the use of the term *direct instruction* is potentially misleading, since this term has been adopted and aggressively "trademarked" by the defenders of a behaviorist approach that Bryson and Scardamalia explicitly reject. I think what they mean to endorse, and what would serve their case better, is something more like *direct experience*—Bryson and Scardamalia want students to have an active, direct immersion in certain target activities. They do not aim to reinforce the transmission model of teaching, but rather to assert that higher-order learning comes from active, guided practice in a supportive social context.

Classroom Connections

Too often, researchers need to call on the services of translators, popular writers, colleges of education, or school inservice programs to make their findings useful to classroom practitioners. Because Bryson and Scardamalia's research essentially validates and strengthens the emerging "process" paradigm of writing instruction, there are already ample resources in place to help teachers follow the guidance this work offers. And it is worth taking a minute to outline just how specifically such help is available.

Bryson and Scardamalia offer three main recommendations to teachers: teach planning strategies, provide procedural facilitation, and serve as a model of a writer at work. Although Bryson and Scardamalia might not be totally delighted by every translation, their main

books for teachers—works by Graves (1983), Calkins (1986), Atwell (1987), Romano (1987), and Zemelman and Daniels (1988). All strongly recommend modeling, calling for teachers to write often with their students, to offer pupils a window into the work and the thinking of an expert writer at work. Graves suggests that teachers offer occasional "think aloud" or "compose-aloud" sessions, during which the teacher vocalizes her thought processes while composing on a blackboard or overhead, giving students a chance to hear some of that internal dialogue between content and rhetoric that Bryson and Scardamalia so strongly recommend.

Bryson and Scardamalia recommend "procedural facilitation," a kind of "nonspecific support related to the student's cognitive processes but not responsive to the actual substance of what the student is thinking or writing." Donald Graves (1983) teaches teachers to engage student authors in "process conferences" in which they ask students questions related to procedures, not content. "What are you working on? Where are you in the piece? What kinds of problems are you facing? What kind of help do you need to move on from here? What are you going to do next?" More generally, Zemelman and Daniels (1989) have described the entire role of the teacher in process writing instruction as a matter of "facilitation," tracing the term back to its origins in group dynamics and humanistic psychology.

Note that the above approaches to modeling and facilitation are also specifically focused on helping students *plan* their writing, learning to consciously (and unconsciously) balance content and rhetorical concerns. This theme of developing higher-order, strategic planning—working and thinking like a "real" writer—pervades the "process" pedagogical literature. For just one outstanding example: Nancie Atwell (1987) warns teachers about the danger of allowing students to work only on content during revisions—in Bryson and Scardamalia's terminology, this would mean remaining at the "knowledge-telling" level of composition. To counteract this tendency and push students up the cognitive ladder, Atwell recommends conferences in which the student begins, not by sharing selections, but by formally paraphrasing the paper and identifying its current problems.

Conclusion

Bryson and Scardamalia's work in the M.U.S.E. project, as well as the several earlier studies they cite, provides strong support for the emerging consensus that so-called "process" writing is the best hope for at-risk students. Happily, we need not wait for classroom translations of Bryson and Scardamalia's recommendations, because they are already in wide professional circulation in books, journals, and face-to-face workshops. Indeed, there is a strong, ongoing national movement to implement the key ideas that Bryson and Scardamalia endorse. What is needed is the time and the money to continue the process of nurturing a paradigm shift, which may well take another generation. Perhaps most importantly, Bryson and Scardamalia have reminded the community of professional educators once again that so-called "at-risk" students do not need a segregated curriculum: what works for them is what is best for everyone.

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